

**Listing of Claims:**

Claim 1 (currently amended): A method to measure a perceived bit rate between a client and a server, the method comprising:

(1) identifying at least one transaction unit, said transaction unit including one or more message pairs;

(2a) if said transaction unit has only a single message pair, confirming that said single message pair does not overlap other message pairs outside of the transaction unit;

(2b) if said transaction unit has a plurality of message pairs, confirming that said message pairs are overlapping;-

(+3) measuring a number of bits transmitted between the client and the server over a time periodduration of said at least one transaction unit; and

(24) adapting, by the server, a type of content to be sent to the client based on a measurement determined during act (+3), wherein:

the number of bits measured are included only within at least one transaction unit, and

the time period is a sum of time durations of each of the at least one transaction unit.

Claim 2 (currently amended): The method of claim 1, wherein:

the number of bits measured are included in a plurality of transaction units, and

the ~~time period~~duration of act (3) is the sum of ~~the~~ time durations of each of the plurality of transaction units.

Claim 3 (currently amended): The method of claim 1, wherein act (+3) is performed on the server and ~~a respective one of the time durations~~the duration of said at least one transaction unit is an amount of time from a beginning of a transmission, from the server, of a first response within the respective transaction unit to a time of a receipt, by the server, of a last acknowledgement within the respective transaction unit.

Claims 4-5 (canceled)

Claim 6 (currently amended): The method of claim 1, wherein act (24) further comprises adapting a resolution of an image to be sent to the client.

Claims 7-8 (canceled)

Claim 9 (currently amended): The method of claim 1, wherein act (13) is performed on the client and the duration of said at least one transaction unit ~~a respective one of the time durations~~ is an amount of time from a beginning of a transmission of a first request, from the client, within the respective transaction unit to a time of a receipt, by the client, of a last response within the respective transaction unit.

Claim 10 (currently amended): The method of claim 9, further comprising:

(35) reporting a bit rate to the server from the client, the bit rate being based on a measurement obtained during act (13).

Claims 11-14 (canceled)

Claim 15 (original): The method of claim 10, wherein the bit rate is reported in a form of a range of bit rates.

Claim 16 (original): The method of claim 10, wherein the bit rate is reported in a form of an exact bit rate.

Claim 17 (original): The method of claim 10, wherein the bit rate is reported in a form of one of a plurality of types, each type reflecting a relative speed of the bit rate.

Claim 18 (currently amended): The method of claim 10, wherein act (13) is performed at an application level within the client, such that a perceived bit rate is measured for a plurality of applications executing on the client.

Claim 19 (original): The method of claim 18, wherein the reporting of the bit rate to the server is performed for each of the plurality of applications.

Claim 20 (original): The method of claim 19, further comprising:

setting an amount of bandwidth desired for at least one of the applications; and  
reserving, by the server, the amount of bandwidth requested by the at least one of the applications.

Claim 21 (original): The method of claim 20, further comprising:

detecting, by the client, when one of the applications is inactive for a specified period of time;

reporting, by the client to the server, that one of the applications is inactive when the detecting determines that the one of the applications is inactive for the specified period of time; and

reallocating, by the server, the amount of the bandwidth to other applications after receiving a report from the reporting.

Claim 22 (currently amended): A machine-readable medium having recorded thereon instructions for a processor, the instructions comprising:

(1) identifying at least one transaction unit, said transaction unit including one or more message pairs;

(2a) if said transaction unit has only a single message pair, confirming that said single message pair does not overlap other message pairs outside of the transaction unit;

(2b) if said transaction unit has a plurality of message pairs, confirming that said message pairs are overlapping;

(43) measuring a number of bits transmitted between a client and a server over a duration of said at least one transaction unit~~time period~~; and

(24) adapting, by the server, a type of content to be sent to the client based on a measurement determined during act (13), wherein:

~~the number of bits measured are those included only within each of a plurality of transaction units, and~~

~~the time period is a sum of time durations of each of the transaction units.~~

Claim 23 (currently amended): The machine-readable medium of claim 22, wherein the instructions for performing act (13) cause act (3) is configured to be performed on the server and the duration of said at least one transaction unit a respective one of the time durations is an amount of time from a beginning of a transmission, from the server, of a first response within the respective transaction unit to a time of a receipt, by the server, of a last acknowledgement within the respective transaction unit.

Claims 24-26 (canceled)

Claim 27 (currently amended): The machine-readable medium of claim 22, wherein the instructions for performing act (13) is configured cause act (3) to be performed by the client and the duration of said at least one transaction unit a respective one of the time durations is an amount of time from a beginning of a transmission of a first request, from the client, within the respective transaction unit to a time of a receipt, by the client, of a last response within the respective transaction unit.

Claim 28 (currently amended): The machine-readable medium of claim 27, further comprising instructions for reporting a bit rate to the server from the client, the bit rate being based on a measurement obtained during act (13).

Claims 29-30 (canceled)

Claim 31 (currently amended): The machine-readable medium of claim 28, wherein the instructions for performing act (13) is performed~~cause act (3) to be performed~~ at an application level within the client, such that a perceived bit rate is measured for a plurality of applications executing on the client.

Claim 32 (original): The machine-readable medium of claim 31, wherein the reporting of the bit rate to the server is performed for each of the plurality of applications.

Claim 33 (currently amended): The machine-readable medium of claim 32, further comprising instructions for:  
setting an amount of bandwidth desired for at least one of the applications.

Claim 34 (currently amended): The machine-readable medium of claim 33, further comprising instructions for:  
detecting, by the client, when one of the applications is inactive for a specified period of time; and  
reporting, by the client to the server that one of the applications is inactive when the detecting determines that the one of the applications is inactive for the specified period of time.

Claim 35 (currently amended): An apparatus for measuring a perceived bit rate between the apparatus and a second apparatus, the apparatus comprising:

a bit rate measurer to measure a number of bits transmitted between the apparatus and the second apparatus over a time period; and

an adapter to adapt a type of content to be sent to the second apparatus based on a measurement determined by the bit rate measurer, wherein:

the number of bits measured are those included only within at least one transaction unit, wherein said at least one transaction unit has one or more transaction pairs that do not overlap with transaction pairs outside of the transaction unit, and wherein if said transaction unit has a plurality of transaction pairs, said plurality of transaction pairs are overlapping, and

the time period is a sum of time durations of each of the at least one transaction unit.

Claim 36 (currently amended): The apparatus of claim 35, wherein the apparatus functions as a server and the second apparatus functions as a client and the duration of said at least one transaction unit~~respective one of the time durations~~ is an amount of time from a beginning of a transmission, from the server, of a first response within the respective transaction unit to a time of a receipt, by the server, of a last acknowledgement within the respective transaction unit.

Claims 37-38 (canceled)

Claim 39 (currently amended): The apparatus of claim 59, wherein the apparatus is arranged to function as a client, the second apparatus is arranged to function as a server and the duration of said at least one transaction unit~~respective one of the time durations~~ is an amount of time from a beginning of a transmission of a first request, from the client, within the respective transaction unit to a time of a receipt, by the client, of a last response within the respective transaction unit.

Claims 40-41 (canceled)

Claim 42 (previously presented): The apparatus of claim 59, wherein the bit rate reporter is arranged to report the bit rate to the server for each of the plurality of applications.

Claim 43 (previously presented): The apparatus of claim 42, further comprising:

a bandwidth setter to allow a setting of an amount of bandwidth desired for at least one of the applications.

Claim 44 (previously presented): The apparatus of claim 43, further comprising:

an inactive application detector to detect when one of the applications is inactive for a specified period of time, the inactive application detector being arranged to report to the server

that one of the applications is inactive when the inactive application detector determines that the one of the applications is inactive for the specified period of time.

Claim 45 (currently amended): A system for measuring a perceived bit rate, comprising:

a first apparatus configured to function as a server and including an adaptor; and

a second apparatus configured to function as a client comprising:

a bit rate measurer to measure a number of bits transmitted between the second apparatus and the first apparatus over a time period which is at most equal to a predetermined time period, wherein:

the adaptor is configured to adapt a type of content to be sent to the second apparatus based on a measurement determined by the bit rate measurer,

the number of bits measured are those included only within at least one transaction unit, wherein said at least one transaction unit has one or more transaction pairs that do not overlap with transaction pairs outside of the transaction unit, and wherein if said transaction unit has a plurality of transaction pairs, said plurality of transaction pairs are overlapping, and

the time period is a sum of time durations of each of the at least one transaction unit.

Claim 46 (previously presented): The system of claim 45, wherein the bit rate measurer is arranged to measure the bit rate according to a formula:

$$BR(i) = \frac{1}{T'} \left[ \left( \sum_{j=0}^{N(i)-1} P_u(i-j) \right) + \left( P_u(i-N(i)) \cdot \left[ \frac{T' - \sum_{j=0}^{N(i)-1} \Delta T_u(i-j)}{\Delta T_u(i-N(i))} \right] \right) \right],$$

where  $BR(i)$  is a bit rate at an index time  $i$ ,  $T' = \text{Min}\left(T, \sum_{j=0}^i \Delta T_u(i-j)\right)$ ,  $T$  is the time period,  $\Delta T_u(i-j)$  is a time difference from a first request sent from the second apparatus and a last response received by the second apparatus from the first apparatus within a  $(i-j)^{th}$  transaction unit,  $P_u(i-j)$  is a total amount of data exchanged during the  $(i-j)^{th}$  transaction unit, and  $N(i)$  is a largest integer, such that  $\sum_{j=0}^{N(i)-1} \Delta T_u(i-j) < T'$ .

Claim 47 (previously presented): The system of claim 45, wherein the bit rate measurer is arranged to measure the bit rate according to a formula:

$$BR(i) = \frac{1}{T'} [BR(i-1) \cdot (T' - \Delta T_u(i)) + P_u(i)],$$

where  $BR(i)$  is a bit rate at an index time  $i$ ,  $T' = \text{Min}\left(T, \sum_{j=0}^i \Delta T_u(i-j)\right)$ ,  $T$  is the time period,  $\Delta T_u(i)$  is a time difference from a first request sent from the second apparatus and a last response received by the second apparatus from the first apparatus within an  $i^{th}$  transaction unit, and  $P_u(i)$  is a total amount of data exchanged during the  $i^{th}$  transaction unit.

Claim 48 (previously presented): The system of claim 45, wherein the second apparatus further comprises a bit rate reporter to report the bit rate to the first apparatus, the bit rate being based on a measurement determined by the bit rate measurer.

Claim 49 (previously presented): A mobile terminal for sending and receiving data wirelessly, the mobile terminal comprising:



a bit rate measurer to measure a number of bits transmitted between the mobile terminal and a server over a time period, wherein:

the number of bits measured are those included only within each of a plurality of transaction units,

the time period is a sum of time durations of each of the transaction units, and

the bit rate measurer is arranged to measure the bit rate at an application level within the mobile terminal, such that a perceived bit rate is measured for a plurality of applications executing on the mobile terminal.

Claim 50 (previously presented): A server for communicating with a client, the server comprising:

a bit rate measurer to measure a number of bits transmitted between the server and the client over a time period;

an adapter to adapt content to be sent to the client based on a measurement determined by the bit rate measurer, wherein:

the number of bits measured are those included only within at least one transaction unit,

the time period is a sum of time durations of each of the at least one transaction unit,

a respective one of the time durations is an amount of time from a beginning of a transmission, from the server, of a first response within the respective transaction unit to a time of a receipt, by the server, of a last acknowledgement within the respective transaction unit, and

the bit rate measurer is configured to measure the bit rate according to a formula:

$$BR(i) = \frac{1}{T'} [BR(i-1) \cdot (T' - \Delta T_u(i)) + P_u(i)],$$

where  $BR(i)$  is a bit rate at an index time  $i$ ,  $T' = \text{Min} \left( T, \sum_{j=0}^i \Delta T_u(i-j) \right)$ ,  $T$  is the time

period,  $\Delta T_u(i)$  is a time difference from a first response and a last acknowledgement within an

$i^{th}$  transaction unit, and  $P_u(i)$  is a total amount of data exchanged during the  $i^{th}$  transaction unit.

Claim 51 (previously presented): A method to measure a perceived bit rate between a client and a server, the method comprising:

(1) measuring a number of bits transmitted between the client and the server over a time period, wherein:

the number of bits measured are included only within at least one transaction unit,  
the time period is a sum of time durations of each of the at least one transaction unit, and  
act (1) is performed by the server according to a formula:

$$BR(i) = \frac{1}{T'} \left[ \left( \sum_{j=0}^{N(i)-1} P_u(i-j) \right) + \left( P_u(i-N(i)) \cdot \left[ \frac{T' - \sum_{j=0}^{N(i)-1} \Delta T_u(i-j)}{\Delta T_u(i-N(i))} \right] \right) \right],$$

where  $BR(i)$  is a bit rate at an index time  $i$ ,  $T' = \min \left( T, \sum_{j=0}^i \Delta T_u(i-j) \right)$ ,  $T$  is the time period,

$\Delta T_u(i-j)$  is a time difference from a first response and a last acknowledgement within a  $(i-j)^{th}$  transaction unit,  $P_u(i-j)$  is a total amount of data exchanged during the  $(i-j)^{th}$  transaction unit, and  $N(i)$  is a largest integer, such that  $\sum_{j=0}^{N(i)-1} \Delta T_u(i-j) < T'$ .

Claim 52 (previously presented): A method to measure a perceived bit rate between a client and a server, the method comprising:

(1) measuring a number of bits transmitted between the client and the server over a time period, wherein:

the number of bits measured are included only within at least one transaction unit,  
the time period is a sum of time durations of each of the at least one transaction unit, and  
act (1) is performed by the server according to a formula:

$$BR(i) = \frac{1}{T'} [BR(i-1) \cdot (T' - \Delta T_u(i)) + P_u(i)],$$

where  $BR(i)$  is a bit rate at an index time  $i$ ,  $T' = \text{Min} \left( T, \sum_{j=0}^i \Delta T_u(i-j) \right)$ ,  $T$  is the time period,  $\Delta T_u(i)$  is a time difference from a first response and a last acknowledgement within an  $i^{\text{th}}$  transaction unit, and  $P_u(i)$  is a total amount of data exchanged during the  $i^{\text{th}}$  transaction unit.

Claim 53 (previously presented): A method to measure a perceived bit rate between a client and a server, the method comprising:

(1) measuring a number of bits transmitted between the client and the server over a time period, wherein:

the number of bits measured are included only within at least one transaction unit,  
the time period is a sum of time durations of each of the at least one transaction unit, and  
act (1) is performed by the client according to a formula:

$$BR(i) = \frac{1}{T'} \left[ \left( \sum_{j=0}^{N(i)-1} P_u(i-j) \right) + \left( P_u(i-N(i)) \cdot \frac{T' - \sum_{j=0}^{N(i)-1} \Delta T_u(i-j)}{\Delta T_u(i-N(i))} \right) \right],$$

where  $BR(i)$  is a bit rate at an index time  $i$ ,  $T' = \text{Min} \left( T, \sum_{j=0}^i \Delta T_u(i-j) \right)$ ,  $T$  is the time period,  $\Delta T_u(i-j)$  is a time difference from a first request sent from the client and a last response received by the client from the server within a  $(i-j)^{\text{th}}$  transaction unit,  $P_u(i-j)$  is a total amount of data exchanged during the  $(i-j)^{\text{th}}$  transaction unit, and  $N(i)$  is a largest integer, such that  $\sum_{j=0}^{N(i)-1} \Delta T_u(i-j) < T'$ .

Claim 54 (previously presented): A method to measure a perceived bit rate between a client and a server, the method comprising:

(1) measuring a number of bits transmitted between the client and the server over a time period, wherein:

the number of bits measured are included only within at least one transaction unit,  
the time period is a sum of time durations of each of the at least one transaction unit, and  
act (1) is performed by the client according to a formula:

$$BR(i) = \frac{1}{T'} [BR(i-1) \cdot (T' - \Delta T_u(i)) + P_u(i)],$$

where BR(i) is a bit rate at an index time i,  $T' = \text{Min} \left( T, \sum_{j=0}^i \Delta T_u(i-j) \right)$ , T is the time period,  $\Delta T_u(i)$  is a time difference from a first request sent from the client and a last response received by the client from the server within an  $i^{\text{th}}$  transaction unit, and  $P_u(i)$  is a total amount of data exchanged during the  $i^{\text{th}}$  transaction unit.

Claim 55 (previously presented): A machine-readable medium having recorded thereon instructions for a processor, the instructions comprising:

(1) measuring a number of bits transmitted between a client and a server over a time period, wherein:

the number of bits measured are those included only within each of a plurality of transaction units,

the time period is a sum of time durations of each of the transaction units, and

act (1) is configured to be performed by the server according to a formula:

$$BR(i) = \frac{1}{T'} \left[ \left( \sum_{j=0}^{N(i)-1} P_u(i-j) \right) + \left( P_u(i-N(i)) \cdot \left[ \frac{T' - \sum_{j=0}^{N(i)-1} \Delta T_u(i-j)}{\Delta T_u(i-N(i))} \right] \right) \right],$$

where  $BR(i)$  is a bit rate at an index time  $i$ ,  $T' = \text{Min} \left( T, \sum_{j=0}^i \Delta T_u(i-j) \right)$ ,  $T$  is the time period,

$\Delta T_u(i-j)$  is a time difference from a first response and a last acknowledgement within a  $(i-j)^{th}$  transaction unit,  $P_u(i-j)$  is a total amount of data exchanged during the  $(i-j)^{th}$  transaction unit, and  $N(i)$  is a largest integer, such that  $\sum_{j=0}^{N(i)-1} \Delta T_u(i-j) < T'$ .

Claim 56 (previously presented): A machine-readable medium having recorded thereon instructions for a processor, the instructions comprising:

(1) measuring a number of bits transmitted between a client and a server over a time period, wherein:

the number of bits measured are those included only within each of a plurality of transaction units,

the time period is a sum of time durations of each of the transaction units,

act (1) is configured to be performed by the server according to a formula:

$$BR(i) = \frac{1}{T'} [BR(i-1) \cdot (T' - \Delta T_u(i)) + P_u(i)],$$

where  $BR(i)$  is a bit rate at an index time  $i$ ,  $T' = \text{Min}\left(T, \sum_{j=0}^i \Delta T_u(i-j)\right)$ ,  $T$  is the time period,  $\Delta T_u(i)$  is a time difference from a first response and a last acknowledgement within an  $i^{\text{th}}$  transaction unit, and  $P_u(i)$  is a total amount of data exchanged during the  $i^{\text{th}}$  transaction unit.

Claim 57 (previously presented): A machine-readable medium having recorded thereon instructions for a processor, the instructions comprising:

(1) measuring a number of bits transmitted between a client and a server over a time period, wherein:

the number of bits measured are those included only within each of a plurality of transaction units,

the time period is a sum of time durations of each of the transaction units, and

act (1) is configured to be performed by the client according to a formula:

$$BR(i) = \frac{1}{T'} \left[ \left( \sum_{j=0}^{N(i)-1} P_u(i-j) \right) + \left( P_u(i-N(i)) \cdot \left[ \frac{T' - \sum_{j=0}^{N(i)-1} \Delta T_u(i-j)}{\Delta T_u(i-N(i))} \right] \right) \right],$$

where  $BR(i)$  is a bit rate at an index time  $i$ ,  $T' = \text{Min}\left(T, \sum_{j=0}^i \Delta T_u(i-j)\right)$ ,  $T$  is the time period,

$\Delta T_u(i-j)$  is a time difference from a first request sent from the client and a last response received by the client from the server within a  $(i-j)^{\text{th}}$  transaction unit,  $P_u(i-j)$  is a total amount of data exchanged during the  $(i-j)^{\text{th}}$  transaction unit, and  $N(i)$  is a largest integer, such

that  $\sum_{j=0}^{N(i)-1} \Delta T_u(i-j) < T'$ .

Claim 58 (previously presented): A machine-readable medium having recorded thereon instructions for a processor, the instructions comprising:

(1) measuring a number of bits transmitted between a client and a server over a time period, wherein:

the number of bits measured are those included only within each of a plurality of transaction units,

the time period is a sum of time durations of each of the transaction units, and

act (1) is configured to be performed by the client according to a formula:

$$BR(i) = \frac{1}{T'} [BR(i-1) \cdot (T' - \Delta T_u(i)) + P_u(i)],$$

where  $BR(i)$  is a bit rate at an index time  $i$ ,  $T' = \text{Min} \left( T, \sum_{j=0}^i \Delta T_u(i-j) \right)$ ,  $T$  is the time

period,  $\Delta T_u(i)$  is a time difference from a first request sent from the client and a last response received by the client from the server within an  $i^{\text{th}}$  transaction unit, and  $P_u(i)$  is a total amount of data exchanged during the  $i^{\text{th}}$  transaction unit.

Claim 59 (previously presented): An apparatus for measuring a perceived bit rate between the apparatus and a second apparatus, the apparatus comprising:

a bit rate measurer to measure a number of bits transmitted between the apparatus and the second apparatus over a time period; and

a bit rate reporter to report the bit rate to the second apparatus, functioning as the server, the bit rate being based on a measurement determined by the bit rate measurer, wherein:

the number of bits measured are those included only within at least one transaction unit,

the time period is a sum of time durations of each of the at least one transaction unit, and

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the bit rate measurer is arranged to measure the bit rate at an application level within the client, such that a perceived bit rate is measured for a plurality of applications executing on the client.